

Notice of Allowability

Application No.

09/336,636

Applicant(s)

HASEGAWA ET AL.

Examiner

Art Unit

Pankaj Kumar

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 2/3/2006.
2. ☒ The allowed claim(s) is/are 1-18, 20-32 and 36.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in telephone interviews/email with Dexter Chang such as on 3/1/2006, 3/2/2006, 3/13/2006.

The application has been amended as follows:

The entire set of claims with their respective amendments are presented herein for clarity:

1. (currently amended) A digital subscriber line communicating system for communicating between a transmitting side and a receiving side through a communication line, comprising:

a sliding window generating unit for generating a sliding window based on a timing signal representing a periodical noise duration; and

a sliding window transmitting unit for transmitting discrete multitone (DMT) symbols according to said sliding window through said communication line to said receiving side;

said sliding window generating unit comprising:

a hyperframe counter for periodically counting a predetermined number of continuous transmitting DMT symbols constituting a hyperframe synchronized with said timing signal; and

a decoder for discriminating, based on ~~[[the]]~~ a count value output from said hyperframe counter, whether a transmitting data symbol belongs to a far end cross-talk duration at said receiving side or a near end cross-talk duration at said receiving side.

2. (currently amended) The digital subscriber line communicating system according to claim 1, wherein said hyperframe counter is reset each time when said hyperframe counter counts said predetermined number of continuous transmitting ~~[[data]]~~ DMT symbols.

3. (currently amended) The digital subscriber line communicating system according to claim 1, wherein said transmitting side is a central office and said receiving side is a remote terminal;

said central office comprising:

a timing signal generating unit for generating said timing signal synchronized with a periodical noise including said periodical noise duration which interferes with said central office and said remote terminal;

a receiver equalizer; and

a sequencer for effecting a transition of ~~[[the]]~~ a status of initialization of said central office during an initialization period before starting usual communication, said initialization period including an activation and acknowledgement sequence, a transceiver training sequence for performing an initial training of said receiver equalizer, a channel analysis sequence for measuring ~~[[the]]~~ a quality of said communication line, and an exchange sequence for

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determining ~~[[the]]~~ a transmitting capacity of said communication line based on the measured quality of said communication line.

4. (original) The digital subscriber line communicating system according to claim 3, wherein, said sequencer effects the transition of the status based on the value counted by said hyperframe counter.

5. (currently amended) The digital subscriber line communicating system according to claim 3, wherein, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence, said initialization is carried out by transmitting said DMT symbols through only ~~[[the]]~~ an inside of said sliding window.

6. (currently amended) The digital subscriber line communicating system according to claim 3, wherein, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence except for a quality measuring sequence, said initialization is carried out by transmitting said DMT symbols through only ~~[[the]]~~ an inside of said sliding window, and during said quality measuring sequence in said channel analysis sequence, said initialization is carried out by transmitting said DMT symbols through both the inside and ~~[[the]]~~ an outside of said sliding window.

7. (original) The digital subscriber line communicating system according to claim 3, further comprising:

a sequence transition determining unit for making a transition, in synchronization with said timing signal, from said activation and acknowledge sequence to said transceiver training sequence or from said transceiver training sequence to said channel analysis sequence.

8. (currently amended) The digital subscriber line communicating system according to claim 1, wherein said transmitting side is a remote terminal and said receiving side is a central office;

said remote terminal comprising:

a timing signal generating unit for generating said timing signal synchronized with a periodical noise including said periodical noise duration which interferes with said remote terminal and said central office;

a receiver equalizer; and

a sequencer for effecting a transition of [[the]] a status of initialization of said remote terminal during an initialization period before starting usual communication, said initialization period including an [[d]] activation and acknowledgement sequence, a transceiver training sequence for performing an initial training of said receiver equalizer, a channel analysis sequence for measuring [[the]] a quality of said communication line, and an exchange sequence for determining [[the]] a transmitting capacity of said communication line based on the measured quality of said communication line.

9. (currently amended) The digital subscriber line communicating system according to claim 8, wherein said sequencer effects the transition of the status based on the value counted by said hyperframe counter.

10. (currently amended) The digital subscriber line communicating system according to claim 8, wherein, according to a single bitmap mode, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence, said initialization is carried out by transmitting DMT symbols through only ~~[[the]]~~ an inside of said sliding window.

11. (currently amended) The digital subscriber line communicating system according to claim 8, wherein, according to a dual bitmap mode, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence except for a quality measuring sequence, said initialization is carried out by transmitting said DMT symbols through only ~~[[the]]~~ an inside of sliding window, and during said quality measuring sequence in said channel analysis sequence, said initialization is carried out by transmitting said DMT symbols through both the inside and ~~[[the]]~~ an outside of sliding window.

12. (original) The digital subscriber line communicating system according to claim 8, further comprising:

a sequence transition determining unit for making a transition, in synchronization with said timing signal, from said activation and acknowledgement sequence to said transceiver training sequence or from said transceiver training sequence to said channel analysis sequence.

13. (currently amended) The digital subscriber line communicating system according to claims 3 or 8, wherein, according to a dual bitmap mode, said DMT symbols are transmitted from said transmitting side through both ~~[[the]]~~ an inside and ~~[[the]]~~ an outside of said sliding window, and said DMT symbols are used for training of said receiver equalizer by said receiving side only when said receiving side is in a far end cross-talk duration.

14. (currently amended) The digital subscriber line communicating system according to claim 3 or 8, wherein, according to ~~[[said]]~~ a dual bitmap mode, during the training of said receiver equalizer in said transceiver training sequence, a step size for updating coefficients of said receiver equalizer is made to be zero ~~in said near end cross-talk duration~~, or to be a value smaller than ~~[[the]]~~ a step size value in said far end cross-talk duration ~~in said near end cross-talk duration~~ at said receiving side or at said transmitting side, so that said transceiver training sequence is carried out continuously in said far end cross-talk duration and said near end cross-talk duration at said receiving side.

15. (currently amended) The digital subscriber line communicating system according to claim 3 or 8, wherein said receiving side comprises:

a synchronization symbol detecting unit for detecting a synchronization symbol included in each of superframes which constitute said hyperframe;

an inverse synchronization symbol detecting unit for detecting an inverse synchronization symbol included in said hyperframe; and

an inverting unit for rotating ~~[[the]]~~ a phase of each carrier signal of the detected inverse synchronization symbol, except for the carrier signal of a pilot tone, by substantially 180° to obtain an inverted inverse synchronization symbol having ~~[[the]]~~ a same phase as ~~[[the]]~~ a phase of each of the detected synchronization symbols;

the detected synchronization symbols and the inverted inverse synchronization symbol being used for the training of said receiver equalizer.

16. (currently amended) The digital subscriber line communicating system according to claim ~~3 or 8~~ 15, wherein for watching or re-synchronizing the superframe or the hyperframe synchronization, in ~~[[the]]~~ a case where the synchronization symbol is detected at the receiving side, the synchronization symbol synchronization is checked with detection of ~~[[the]]~~ a next inverse synchronization symbol, and in ~~[[the]]~~ a case where the inverse synchronization symbol is detected, on the other hand, the synchronization symbol synchronization is checked with ~~[[the]]~~ a next detected synchronization symbol.

17. (currently amended) A digital subscriber line communicating system for communicating between a transceiver in a central office and a transceiver in a remote terminal through a communication line, wherein, during timing recover training sequence between said central office and said remote terminal, an inside discrete multitone (DMT) symbol of a downstream sliding window is formed by a first kind of signal, and an outside DMT symbol of said downstream sliding window is formed by a second kind of signal, said first kind of signal

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and said second kind of signal being obtained by modulating a carrier signal but being different in phase by a predetermined angle, and

said transceiver in said remote terminal recognizes whether a received DMT symbol belongs to a far end cross-talk duration at said remote terminal or a near end cross-talk duration at said remote terminal, by detecting ~~[[the]]~~ a phase of ~~[[the]]~~ an output of a fast Fourier transform of said carrier signal, so as to recognize ~~[[the]]~~ a phase of a timing signal which represents a periodical noise duration.

18. (currently amended) A digital subscriber line communicating system for communicating between a transceiver in a central office and a transceiver in a remote terminal through a communication line, wherein, during timing recover training sequence between said central office and said remote terminal, an inside discrete multitone (DMT) symbol of a downstream sliding window is formed by a first kind of signal, and an outside DMT symbol of said downstream sliding window is formed by a second kind of signal, said first kind of signal and said second kind of signal being obtained by modulating a carrier signal but being different in phase by a predetermined angle, and

said transceiver in said remote terminal recognizes whether a received DMT symbol belongs to a far end cross-talk duration at said remote terminal or a near end cross-talk duration at said remote terminal, by detecting ~~[[the]]~~ a phase of ~~[[the]]~~ an output of a quadrature phase shift keying demodulation of said carrier signal, so as to recognize ~~[[the]]~~ a phase of a timing signal which represents a periodical noise duration.

19. (canceled)

20. (currently amended) A transceiver to be connected through a communication line, comprising:

a sliding window generating unit for generating a sliding window based on a timing signal representing a periodical noise duration; and

a sliding window transmitting unit for transmitting discrete multitone (DMT) symbols according to said sliding window through said communication line to ~~[[said]]~~ a receiving side;

said sliding window generating unit comprising:

a hyperframe counter for periodically counting a predetermined number of continuous transmitting DMT symbols constituting a hyperframe synchronized with said timing signal; and

a decoder for discriminating, based on ~~[[the]]~~ a count value output from said hyperframe counter, whether ~~[[a]]~~ the transmitting ~~[[data]]~~ DMT symbol belongs to a far end cross-talk duration at said receiving side or a near end cross-talk duration at said receiving side.

21. (currently amended) The transceiver according to claim 20, wherein said hyperframe counter is reset each time when said hyperframe counter counts said predetermined number of continuous transmitting ~~[[data]]~~ DMT symbols.

22. (currently amended) The transceiver according to claim 20, further comprising:

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a timing signal generating unit for generating said timing signal synchronized with a periodical noise including said periodical noise duration which interferes with said transmitting [[data]] DMT symbol;

a receiver equalizer; and

a sequencer for effecting a transition of [[the]] a status of initialization of said transceiver during an initialization period before starting usual communication, said initialization period including an activation and acknowledgement sequence, a transceiver training sequence for performing an initial training of said receiver equalizer, a channel analysis sequence for measuring [[the]] a quality of said communication line, and an exchange sequence for determining [[the]] a transmitting capacity of said communication line based on the measured quality of said communication line.

23. (previously presented) The transceiver according to claim 22, wherein, said sequencer effects the transition of the status based on the value counted by said hyperframe counter.

24. (currently amended) The transceiver according to claim 22, wherein, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence, said initialization is carried out by transmitting said DMT symbols through only [[the]] an inside of said sliding window.

25. (currently amended) The transceiver according to claim 22, wherein, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence except for a quality measuring sequence, said initialization is carried out by transmitting said DMT symbols through only ~~[[the]]~~ an inside of said sliding window, and during said quality measuring sequence in said channel analysis sequence, said initialization is carried out by transmitting said DMT symbols through both the inside and ~~[[the]]~~ an outside of said sliding window.

26. (original) The transceiver according to claim 22, further comprising:
a sequence transition determining unit for making a transition, in synchronization with said timing signal, from said activation and acknowledge sequence to said transceiver training sequence or from said transceiver training sequence to said channel analysis sequence.

27. (currently amended) The transceiver according to claim 22, wherein, said DMT symbols are transmitted from ~~[[said]]~~ a transmitting side through both ~~[[the]]~~ an inside and ~~[[the]]~~ an outside of said sliding window, and said DMT symbols are used for training of said receiver equalizer by said receiving side only when said receiving side is in a far end cross-talk duration.

28. (currently amended) The transceiver according to claim 22, wherein, during the training of said receiver equalizer in said transceiver training sequence, a step size for updating coefficients of said receiver equalizer is made to be zero ~~in said near end cross-talk duration, or~~

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to be a value smaller than ~~[[the]]~~ a step size value in said far end cross-talk duration ~~in said near end cross-talk duration~~ at said receiving side or at said transmitting side, so that said transceiver training sequence is carried out continuously in said far end cross-talk duration and said near end cross-talk duration at said receiving side.

29. (currently amended) The transceiver according to claim 22, wherein said receiving side comprises:

a synchronization symbol detecting unit for detecting a synchronization symbol included in each of superframes which constitute said hyperframe;

an inverse synchronization symbol detecting unit for detecting an inverse synchronization symbol included in said hyperframe; and

an inverting unit for rotating ~~[[the]]~~ a phase of each carrier signal of the detected inverse synchronization symbol, except for the carrier signal of a pilot tone, by substantially 180° to obtain an inverted inverse synchronization symbol having ~~[[the]]~~ a same phase as ~~[[the]]~~ a phase of each of the detected synchronization symbols;

the detected synchronization symbols and the inverted inverse synchronization symbol being used for the training of said receiver equalizer.

30. (currently amended) The transceiver according to claim ~~[[22]]~~ 29, wherein for watching or re-synchronizing the superframe or the hyperframe synchronization, in ~~[[the]]~~ a case where the synchronization symbol is detected at the receiving side, the synchronization symbol synchronization is checked with detection of ~~[[the]]~~ a next inverse synchronization symbol, and

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in [[the]] a case where the inverse synchronization symbol is detected, on the other hand, the synchronization symbol synchronization is checked with [[the]] a next detected synchronization symbol.

31. (currently amended) A transceiver to be connected through a communication line, wherein, during timing recover training sequence between a central office and [[said]] a remote terminal, an inside discrete multitone (DMT) symbol of a downstream sliding window is formed by a first kind of signal, and an outside DMT symbol of said downstream sliding window is formed by a second kind of signal, said first kind of signal and said second kind of signal being obtained by modulating a carrier signal but being different in phase by a predetermined angle, and

said transceiver in said remote terminal recognizes whether a received DMT symbol belongs to a far end cross-talk duration at said remote terminal or a near end cross-talk duration at said remote terminal, by detecting [[the]] a phase of [[the]] an output of a fast Fourier transform of said carrier signal, so as to recognize [[the]] a phase of a timing signal which represents a periodical noise duration.

32. (currently amended) A transceiver to be connected through a communication line, wherein, during timing recover training sequence between [[said]] a central office and [[said]] a remote terminal, an inside discrete multitone (DMT) symbol of a downstream sliding window is formed by a first kind of signal, and an outside DMT symbol of said downstream sliding window is formed by a second kind of signal, said first kind of signal and said second kind of signal

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being obtained by modulating a carrier signal but being different in phase by a predetermined angle, and

said transceiver in said remote terminal recognizes whether a received DMT symbol belongs to a far end cross-talk duration at said remote terminal or a near end cross-talk duration at said remote terminal, by detecting ~~[[the]]~~ a phase of ~~[[the]]~~ an output of a quadrature phase shift keying demodulation of said carrier signal, so as to recognize ~~[[the]]~~ a phase of a timing signal which represents a periodical noise duration.

33. – 35. (canceled)

36. (previously presented) An ADSL modem for transmitting high speed data comprising:

a sliding window generating unit for generating a sliding window based on a TCM-ISDN timing signal; and

a sliding window transmitting unit for transmitting discrete multitone (DMT) symbols according to said sliding window;

said sliding window generating unit comprising:

a hyperframe counter for periodically counting a predetermined number of continuous transmitting DMT symbols constituting a hyperframe synchronized with said timing signal.

37. – 39. (canceled)

Remarks: The above amendments have been made for clarity

DETAILED ACTION

Allowable Subject Matter

1. Claims 1-18, 20-30, 31, 32, 36 are allowed.
2. The following is a statement of reasons for the indication of allowable subject matter:
The art of record does not suggest the respective claim combinations together and nor would the respective claim combinations be obvious with the following underlined portions:
3. As per claim 1: *whether a transmitting data symbol belongs to a far end cross talk duration at said receiving side or a near end cross talk duration at said receiving side.*
4. As per claim 20: *whether the transmitting DMT symbol belongs to a far end cross-talk duration at said receiving side or a near end cross-talk duration at said receiving side.*
5. As per claims 17, 18, 31, 32: *whether a received DMT symbol belongs to a far end cross talk duration at said remote terminal or a near end cross talk duration at said remote terminal*
6. As per claim 36: *a sliding window generating unit for generating a sliding window based on a TCM-ISDN timing signal*
7. Claims 2-16 and 21-30 are dependent on certain independent claims cited above.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pankaj Kumar whose telephone number is (571) 272-3011. The examiner can normally be reached on Mon, Tues, Thurs and Fri after 8AM to after 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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